Microair Avionics

T2000 SF/SFL TRANSPONDER USER MANUAL

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ABOUT THIS DOCUMENT

Microair Avionics have developed a series of transponders for use with OEM applications, and for commercial sale by Microair Avionics. The transponder has various configurations for RF engine and display units. The core components however will remain the same design throughout the series.

The manual explains the basic functions and elaborates on the more sophisticated features, such as altitude display and alerts.

Microair reserve the right to amend this manual as required, to reflect any enhancements or upgrades to the T2000 Transponder series.

Statement:
The T2000SF/SFL owner accepts all responsibility for obtaining the proper licensing before using the transponder. The coverage you can expect from the T2000SF/SFL is limited to "line of sight". Low altitude or aircraft antenna shielding by the aircraft itself may result in a reduced range. Range can be improved by climbing to a higher altitude. It may be possible to minimize antenna shielding by locating the antenna where dead spots are only noticed during abnormal flight attitudes.

The T2000SF/SFL should be turned off before starting or shutting down aircraft engine(s).

MICROAIR DOCUMENTS

Microair T2000 Users Manual	T2000-DOC-001
Microair T2000 Installation Manual	T2000-DOC-002
Microair T2000 Flight Manual Supplement	T2000-DOC-003
Microair T2000 Service Manual	T2000-DOC-004

DOCUMENT REVISION STATUS – T2000-DOC-001

Revision	Date	Change
1.0	11/02/01	Initial Draft

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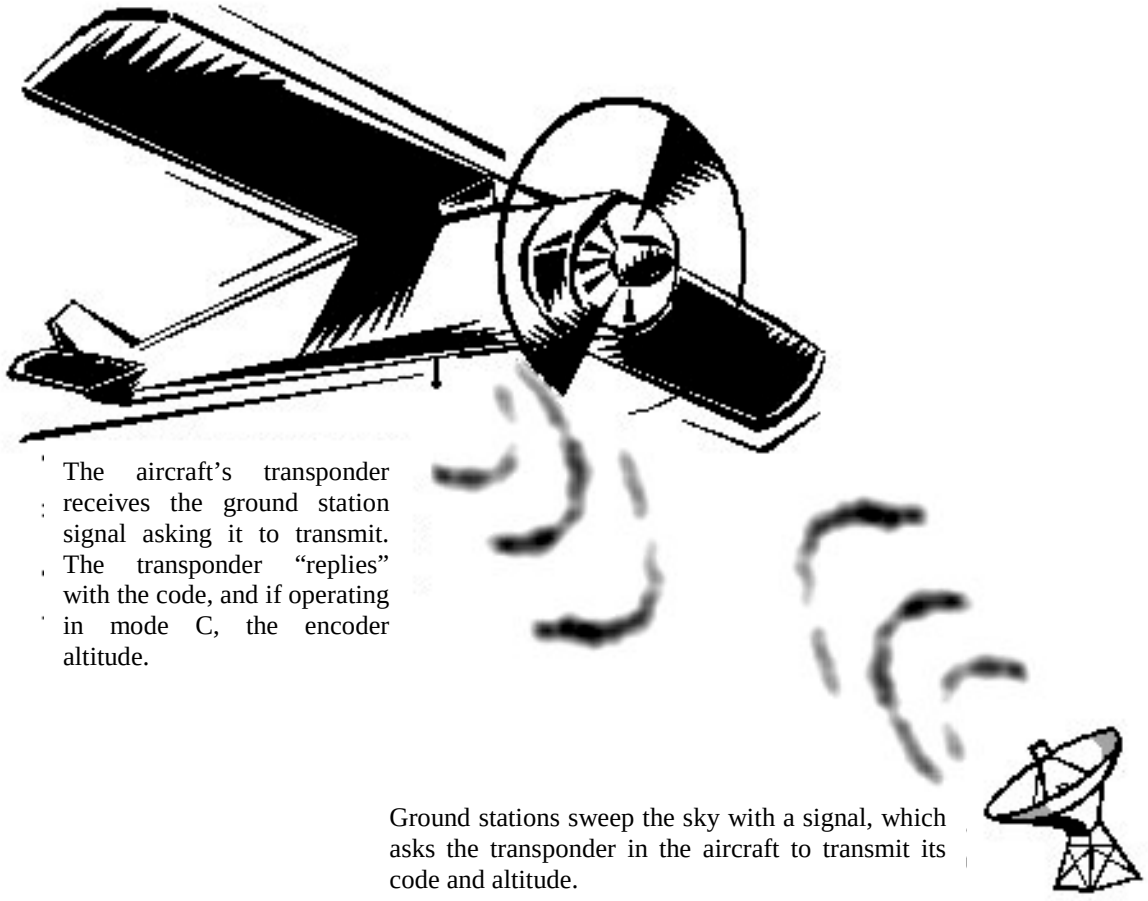
INTRODUCTION

The Microair T2000 Transponder is designed to operate in the environment of a Radar Beacon System. This system interrogates the transponder, which in turn *replies* with an identity code and altitude information. The radar system consists of a network of ground stations, which sweep the horizon like a conventional radar. When the transponder in the aircraft detects the radar sweep (is *illuminated*), the transponder *replies* with a burst transmission giving its identity code and altitude.



The aircraft's transponder receives the ground station signal asking it to transmit. The transponder "replies" with the code, and if operating in mode C, the encoder altitude.

Ground stations sweep the sky with a signal, which asks the transponder in the aircraft to transmit its code and altitude.

The system presents the *replies* from all transponders in range of the ground stations on a single display screen. This allows ATC to easily locate, identify, and see the altitude of all traffic in their airspace.

A transponder's *reply* is termed a *squawk*. Hence the current code being used by the transponder is termed the *squawk code*. At times of high airspace activity, ATC may wish to uniquely identify an individual aircraft with a request to *squawk ident*. The pilot uses the *ident* control on the transponder to make the transponder's *squawk* on the ATC display flash for a short period. The *ident* control should not be used unless ATC request it.

ATC will issue a code to an aircraft requesting entry to its controlled airspace. This code is normally unique for each aircraft, each time that aircraft passes through the airspace. The code is 4 digits long, and each digit can range from 0-7.

There are several special codes, which are used to identify General Aviation aircraft, and some special situations which aircraft could encounter. ***Misuse of these codes may result in legal charges against the user.***

IMPORTANT NOTE
ALWAYS check the standby code, BEFORE transferring it to the ACTIVE position.

0000	Military use only (this code is not selectable)
1200	VFR General Aviation Code (US and other countries)
7000	VFR General Aviation Code (Europe)
7500	Hijack Code
7600	Communications Failure
7700	Emergency Code
7777	Military Intercept Code (NEVER USE)

The user should check the Civil Aviation Rules/Regulations to determine the VFR General Aviation transponder code for their country.

OPERATION

The transponder can be operated in the following modes:

ON Transponder operates in modes **A** & **C** with no altitude information being transmitted.
ALT Transponder operates in modes **A** & **C** with altitude information being transmitted.

If requested by ATC the user can *squawk ident*. The transponder will add an extra piece of data to the transmission, to make the code and altitude information flash on the ATC radar display.

When operating in **ALT** mode, altitude data is received from a separate altitude encoder. This data is passed back to the transponder to be included in the response transmission to **ATC**. The Microair T2000 is compatible with any industry standard altitude encoder with parallel output.

The display can present the active and standby codes. The standby code can be changed at any time, and then *toggled* to become the active code. The T2000 can replace the standby code with the encoder altitude, or supply voltage.

In addition to the required TSO functions, the Microair T2000 offers a number of other useful features, which can be displayed by the operator either as a pop-up message, audio beep, or a display option.

T2000 SF/SFL

The Microair **T2000 SF/SFL** are 57mm diameter face versions to fit the standard 2 ¼ inch instrument hole. The mounting is by 4 x M4 machine screws, located through the panel and screwed into threaded holes in each corner of the transponder's front face.

The **SF** display is a two line **LED** unit of 8 characters per line. The **SFL** is a two line **LCD** display of 8 characters per line, with backlighting.

Microair T2000 SFL

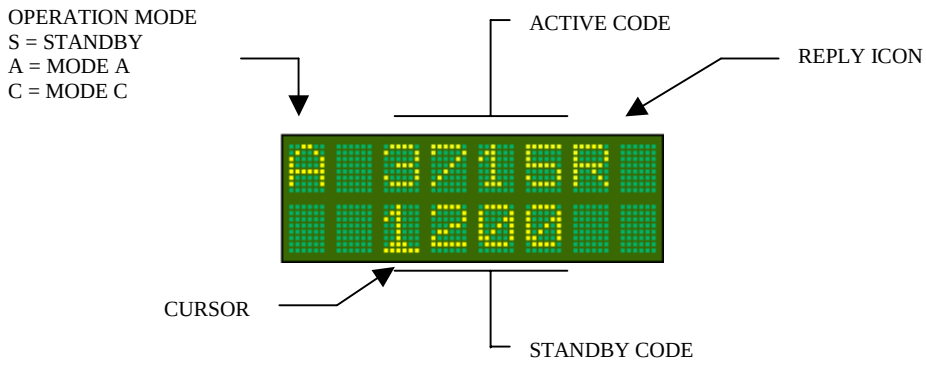
DISPLAY FUNCTION

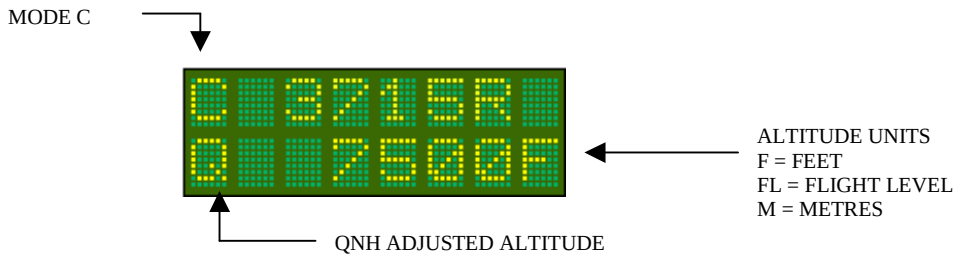
T2000SF

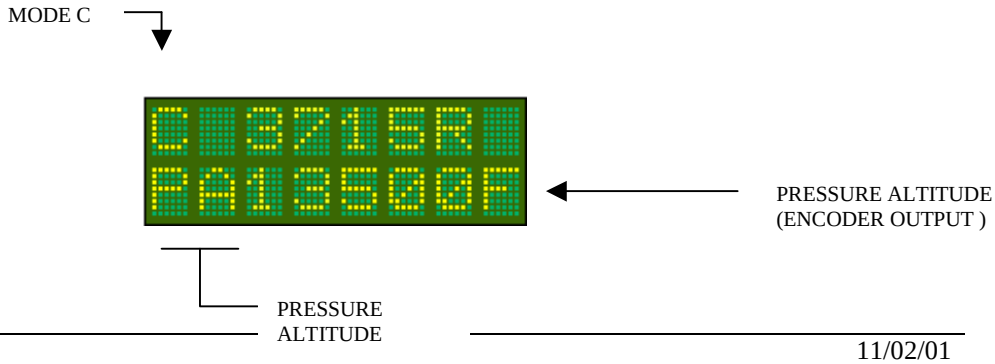
The **SF** is a dual line display of 8 characters each, with the active code on the top line, and the standby code on the bottom. The display is **LED**, with the brightness controlled by a light sensor adjacent to the display.

T2000SFL

The **SFL** is a dual line display of 8 characters each, with the active code on the top line, and the standby code on the bottom. The display is **LCD**, with preset backlighting.







When the altitude is displayed, the standby code is saved into memory. To display the standby code again, press the < > key once to make it appear on the bottom line. Press the < > key again to exchange the active and standby codes. After 10 seconds of inactivity, the display will revert to displaying the altitude.

Pressure Altitude is the Encoder altitude. The encoder's barometric adjustment is preset to 1013 millibars (29.92HG). If the Encoder is not powered or not fitted, the message **NO ALT** will appear on the display.

It is possible to input the **QNH** (barometric pressure) given by ATC, into the **T2000** to adjust the displayed pressure altitude. This feature will allow the user to adjust the displayed altitude to read the same as the aircraft's altimeter.

> ***IMPORTANT NOTE***
> ***When passing upwards through the transition level/layer the altimeter and transponder should both be set to 1013mb (29.92HG). When passing down through the transition level/layer the altimeter and transponder are reset to the QNH (barometric pressure) given by ATC.***

The **T2000** will transmit the encoder altitude (pressure altitude) only, in accordance with normal mode C operation. The adjusted **QNH** altitude is *never* transmitted.

CONTROLS FUNCTIONS

This section describes the transponder control keys and their functions. Many of the control keys have more than one function, and some keys access multi-option menus, which can be scrolled.

SELECTMODE KNOB

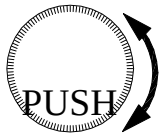
The **SELECTMODE** knob allows the user to switch the transponder between the 4 operating modes.

STANDBY	In standby the transponder is powered up, but will not transmit. *On the active display line the letter **S** appears on the left hand side.*
ON	Will reply to Mode **A** and **C** interrogations, but with no mode **C** encoder information. Mode **C** blind encoder is normally powered up in this mode, but can be powered down if encoder power option is set **OFF** (refer Encoder power in Initialisation and Setup section). *On the active display line the letter **A** appears on the left hand side.*
ALT	Will reply to Mode **A** and **C** interrogations, with the mode **C** encoder information. In the absence of a valid encoder input, only the **C** framing pulse will be sent. *On the active display line the letter **C** appears on the left hand side.*
DISPLAY ALT	The standby code is replaced with the encoder altitude. If the **QNH** has been set via the **QNH ENTRY** option of **MODE MENU**, the displayed altitude will be adjusted for barometric air pressure. Altitude will be displayed in units set in **ALTITUDE UNITS** option of **MODE MENU**. *Pressure Altitude can be displayed as:* • Pressure Altitude & FL **PA FL 0 7 5** displayed • Pressure Altitude & feet **PA 7 5 0 0F** displayed • Pressure Altitude & metres **PA 2 3 0 0M** displayed *QNH corrected altitude can be displayed as:* • QNH Altitude & FL **Q FL 0 7 5** displayed • QNH Altitude & feet **Q 7 5 0 0F** displayed • QNH Altitude & metres **Q 2 3 0 0M** displayed The **DISPLAY ALT** only displays altitude if a valid encoder input is being received. When climbing above the transition level/layer the user must reset the transponder's **QNH** to **1013** (the default value), at the same time the aircraft's altimeter is adjusted. *On the active display line the letter **C** appears on the left hand side.*

SF/SFL SELECTMODE Knob

CODE ADJUST Knob

The **CODE ADJUST** knob can be rotated clockwise to scroll upwards, and counter-clockwise to scroll downwards. Each digit of the code is adjusted separately. The adjust function starts with the left hand digit and is moved across to the next digit by pushing the **CODE ADJUST** knob inwards. After 10 seconds of inactivity the cursor will revert to the left hand digit. The **CODE ADJUST** knob is also used to scroll through some of the **MODE MENU** functions and **PROGRAM MODE** items.



CODE ADJUST

SF/SFL CODE ADJUST Knob

ON KEY

For the **SF**, pressing the **ON** key once will turn the transponder **ON**. To turn the transponder **OFF**, hold the **ON** key down for 3 seconds, the message **TURNING OFF** is displayed briefly, then the transponder will shut down.

For the **SFL**, pressing the **ON** key once will turn the transponder **ON**. Pressing the **ON** key a second time will activate the backlighting to the pre-set minimum brightness level (refer the Initialisation and Set-up section). Pressing **ON** a third time will bring the backlighting to its maximum brightness level. Press a fourth time and the display will revert back to no backlighting. The **SFL** is turned **OFF** in the same way as the **SF**.

SF/SFL ON Key

For the **SF** only the control keys are backlit. The **LED** display is continuously lit, with the level of brightness controlled by the Photo Sensor on the front face.

MODE KEY

The **MODE** key can be used to access two separate menus:

SF/SFL MODE Key

- If the transponder is turned on, by holding down both the **ON** key and the **MODE** key, the transponder will start in **PROGRAM MODE** (refer Initialisation and Set-up).

- If the transponder is **ON** and in normal operation, press the **MODE** key to access the **MODE MENU**.

MODE MENU	**QNH ENTRY**
	ASSIGNED ALTITUDE
	ALTITUDE BUFFER
	ALTITUDE UNITS
	VOLTAGE
	BEEP

CODE ADJUST
rotate to scroll menu

QNH ENTRY (BAROMETER SETTING)

Altitude encoders output a pressure altitude fixed at an *above mean sea level* (**AMSL**) pressure of 1013mb (***29.92***HG). The aircraft's altimeter is normally adjusted for actual surface pressure before take off. This means the encoder altitude may not be the same as the altimeter reading.

The **QNH** can be entered here to allow the T2000 to adjust the displayed altitude to **QNH** altitude, and hence read the same as the aircraft's altimeter. The default **QNH** is 1013 (***29.92***HG). If the **QNH** is set to 1013 (***29.92***HG), the altitude displayed will default to the unadjusted pressure altitude direct from the encoder. If the **QNH** is set to a discrete value (normally provided by ATC), the displayed altitude will be the encoder pressure altitude adjusted for that **QNH** value.

Rotate **CODE ADJUST** knob	Scroll to **QNH ENTRY** option
Press **ENTER** key	To select **QNH ENTRY** option
Rotate **CODE ADJUST** knob	Set **QNH = 1013** to desired **QNH**. The default is **1013**(mb) or **29.92**(HG)
Press **ENTER** key	The message **SAVED** appears briefly on the display
	Display returns to **QNH ENTRY** in **MODE MENU**

The barometric units are set in the **BAROMETRIC UNITS** option of the **PROGRAM MODE**.

IMPORTANT NOTE
The T2000 will only transmit the encoder pressure altitude. The adjusted QNH altitude is NEVER transmitted, even when it is being displayed.

ASSIGNED ALTITUDE

The user can input an assigned altitude given by ATC. When used with the altitude buffer value, an audio alert and display indicator advise when the aircraft has climbed or descended from the assigned altitude.

Rotate **CODE ADJUST** knob	Scroll to **ASSIGNED ALTITUDE** option
Press **ENTER** key	To select **ASSIGNED ALTITUDE** option
Rotate **CODE ADJUST** knob	Set **ALT = 0** to desired altitude. The default is **0**
Press **ENTER** key	The message **SAVED** appears briefly on the display
	Display returns to **ASSIGNED ALTITUDE** in **MODE MENU**

If the **ASSIGNED ALTITUDE** is set **ALT = 0**, the altitude alert function is disabled. The altitude units are set in the **ALTITUDE UNITS** option of the **PROGRAM MODE**.

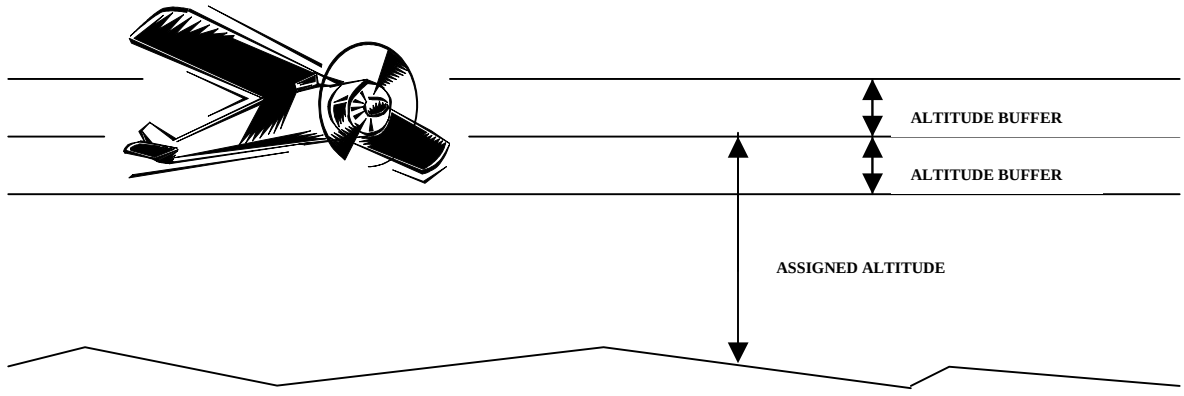
The assigned altitude function is only active when the **SELECTMODE** knob is set to **DISP ALT**. If the **ASSIGNED BUFFER** has not been set, the default alert is +/-100 feet or +/-30 metres.

ASSIGNED BUFFER

The user can input a buffer altitude, above and below the assigned altitude, to define a height band in which to fly. When the aircraft exceeds the upper or lower limit, an indicator arrow will be displayed to show the direction (up or down) the aircraft is going. If the **BEEP** function is **ON**, an audio tone will be heard as well.

If the **ALTITUDE UNITS** are set to **FEET** or **FL**, the **BUFFER** increments are in 100 foot units. If the **ALTITUDE UNITS** are set to **METRES**, the **BUFFER** increments are in 30 metre units.

Rotate **CODE ADJUST** knob	Scroll to **ASSIGNED BUFFER** option
Press **ENTER** key	To select **ASSIGNED BUFFER** option
Rotate **CODE ADJUST** knob	Set **BUFFER=100** to desired altitude. The default is 100 (ft) or 30 (m)
Press **ENTER** key	The message **SAVED** appears briefly on the display
	Display returns to **ASSIGNED BUFFER** in **MODE MENU**



ALTITUDE UNITS

The altitude data can be displayed as feet, flight level, or metres. Once the **ALTITUDE UNITS** are set all altitude data is displayed in these units. The exception is when the **ALTITUDE UNITS** are set to **FL**, the **ALTITUDE BUFFER** is still displayed and set in **FEET**.

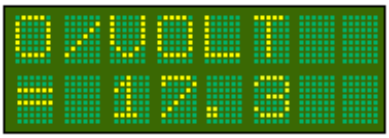
Rotate **CODE ADJUST** knob	Scroll to **ALTITUDE UNITS** option
Press **ENTER** key	To select **ALTITUDE UNITS** option
Rotate **CODE ADJUST** knob	Set **UNITS = FEET/FL/METRES** The default is **FEET**
Press **ENTER** key	The message **SAVED** appears briefly on the display
	Display returns to **ALTITUDE UNITS** in **MODE MENU**

VOLTAGE (Voltage setpoints , Receive Volts)

The **VOLTAGE** function will display the aircraft's supply voltage , and by turning the scroll button the set points for the voltage alerts and the receive volts can be displayed. Receive volt are used for diagnostic function only and have no relevance to normal operation. The receive voltage will display a value between 0 and 255 (higher the value , stronger the signal). Voltage alarm levels are set in **PROGRAM MODE** menu (see Initialisation and Set-up). Should an alarm activate , simply hit the enter key to acknowledge.

Select VOLT MON	Current input voltage is displayed
Rotate **Code adjust** knob	Over voltage set point high is displayed (e.g O/V 16.00)
Rotate **Code adjust** knob	Under voltage set point low is displayed (e.g U/V 10.00)
Rotate **Code adjust** knob	Receive VOLTS is displayed (e.g 120)
Rotate **Code adjust** knob	Display returns to **VOLTS** display

When the transponder is operating in normal display operation mode, the over and under input voltage alert flashes as a warning (for periods of 1 second every 5 seconds), and if the **BEEP** function is set **ON**, an audio tone can be heard. Reset this by hitting enter. A further alert will happen after 5 minutes if the voltage condition is still under / over.



BEEP

The **BEEP** function is used by many of the T2000's features, to alert or confirm a variety of messages and functions. When set **ON**, the **BEEP** also confirms every key press. The **BEEP** can be heard from either the cabin speaker, or through the headphones.

Rotate **CODE ADJUST** knob	Scroll to **BEEP** option.
Press the **ENTER** key	To select **BEEP** option
Rotate **CODE ADJUST** knob	Set **BEEP = ON/OFF** The default is **ON**
Press the **ENTER** key	The message **SAVED** appears briefly on the display
	Display returns to **BEEP** in **MODE MENU**

To exit the **MODE MENU**, scroll the **CODE ADJUST** knob past the **BEEP** option. The display will return to the selected display mode.

ENTER KEY

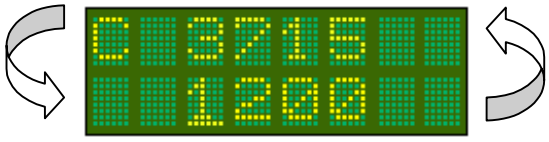
The **ENTER** key is a confirmation key used to confirm information the user has inputted. After pressing the **ENTER** key, the display will typically give the message **SAVED**, for a short period.

The **ENTER** key is also used to select an option from a scrolled menu.

SF/SFL ENTER Key

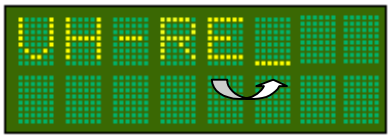
< > KEY

This key acts as a "**toggle**" switch, exchanging the active and standby codes. For the **SF/SFL** the active code is the top line, and the standby is on the bottom line.



When the transponder is operating in **DISPLAY ALT** the bottom line displays the encoder altitude instead of the standby code. The standby code is stored in memory. To toggle the active and standby codes in this mode, push the < > key once to display the standby code on the bottom line. The standby code is displayed for 10 seconds. Push the < > key again to exchange the active and standby codes. Once the codes have been exchanged, the display will revert back after 10 seconds, to displaying the altitude on the bottom line. In all modes of operation, only the active code is transmitted.

The < > key is also used to advance the cursor one position to the right, when keying in information.



SF/SFL TOGGLE Key

VFR – HOT KEY

The **VFR** key will default the standby code immediately to the stored **VFR** code. Typically this code will be **1200** for a General Aviation aircraft.

To set a different **VFR** code, simply hold the **VFR** key down for 3 seconds, and the standby code will change to **VFR 1200**. Use the **CODE ADJUST** knob to set a new **VFR** code and press the **ENTER** key to store. The display will briefly show the **SAVED** message, then revert to the active/standby mode, with the new **VFR** code in the standby position.

To transfer the **VFR** code to the active position, press the < > key. If no code is entered, after 10 seconds idle the standby position will revert back to the original **VFR** code.

SF/SFL VFR Key

ID KEY

The **ID** key (Ident) when pressed, adds additional code information to the transmission for **ATC**. The code will flash on the **ATC** display as a means of uniquely identifying the aircraft's code from any other. The **T2000** has the option of a remote **ID** switch (pin 16).

The external switch should be a momentary-ON type. The switch or ID key only need to be pressed briefly to activate the *ident* function.

SF/SFL IDENT Key

INITIALISATION AND SETUP

The **T2000** will operate as a conventional transponder when first installed and powered up. You will be able to turn the transponder **ON/OFF**, adjust the standby code, and transfer the standby and active codes.

The **T2000** has many other features, which can be programmed. Microair recommend, that the full setup procedure be carried out prior to first flight. This section provides detailed procedures on the various parameters and functions that can be setup from the front panel.

The following procedures provide step by step instructions to program the transponder options.

Program Mode	**Name & Registration**
	Voltage
	Encoder Power
	Display Type
	Display Bright (SF Model)
	Display Timeout (SF Model)
	Barometric Units
	Exit Program

PROGRAM MODE

When the unit is turned **ON** with the **MODE** key held down, the unit will start up in the **PROGRAM MODE**. The screen will display **PROGRAM MODE** then press the **ENTER** key to continue.

The program will sequence through all of the set up options. To exit **PROGRAM MODE** at any time, turn the transponder off for 5 seconds. When turned back on with the **ON** key only, the transponder will then start in selected display mode.

NAME & REGISTRATION (one time only entry)

The **T2000** allows you to enter either your name or aircraft registration into a non-erasable memory. This provides a level of security for the transponder, uniquely identifying it. Once entered, this information will be displayed each time the transponder is turned on.

Your **NAME/REG** may be alpha or numeric or a combination of both, up to 16 characters long.

> ***Important Note***
> ***For security, once you enter and confirm your NAME/REG it cannot be changed without the transponder being returned to an authorised service facility. If a NAME/REG has previously been entered, this PROGRAM MODE item will not be displayed again.***

Rotate **CODE ADJUST** knob	Scroll to **NAME/REG** option
Press **ENTER** key	To select **NAME/REG** option
Rotate **CODE ADJUST** knob	Adjust to desired letter/number for 1st character
Press < > key	Saves character and advances one space to the right
Rotate **CODE ADJUST** knob	Adjust for 2nd character etc (repeat steps 2 & 3 to complete)
Press **ENTER** key	Message **CONFIRM NAME/REG** appears
Press **ENTER** key	Message **TAKEN** appears briefly on the display
	Display returns to **NAME/REG** in **PROGRAM MODE** menu

At the message **CONFIRM NAME/REG**, if you want to go back and edit, press the < > key. The display will return the **NAME/REG** field with the cursor at the right-most character.

VOLTAGE

The **T2000** can monitor aircraft voltage, and alert the pilot to the aircraft electrical system over or under voltage conditions. This is the aircraft supply voltage not just the transponder voltage, and is very useful for troubleshooting aircraft electrical problems. These alerts can be programmed for 14 or 28V aircraft.

Rotate **CODE ADJUST** knob	Scroll to **VOLTAGE MONITOR** option
Press **ENTER** key	To select **VOLTAGE MONITOR** option
Rotate **CODE ADJUST** knob	Set **A/C VOLT = 14/28** The default is **14**
Press the **ENTER** key	The message **SAVED** appears briefly on the display

IMPORTANT NOTE
The T2000 can be connected to either a 14 or 28 volt supply. It is necessary however to set the monitored supply level for this function. The maximum supply voltage for the T2000 is 33 volts. Prolonged supply voltage above 33 volts will damage the transponder.

Having selected the correct supply voltage, you can now program the lower and upper alert voltages that will be shown on the display of the transponder. Note: You should allow a reasonable buffer margin.

Rotate **CODE ADJUST** knob	Set over voltage - eg **O/V = 18.0** for a 14 volt system
Press **ENTER** key	The message **SAVED** appears briefly on the display
Rotate **CODE ADJUST** knob	Set under voltage - eg **U/V = 11.5** for a 14 volt system
Press **ENTER** key	The message **SAVED** appears briefly on the display
	Display returns to **VOLTAGE MONITOR** in **PROGRAM MODE** menu

ENCODER POWER

This controls the output volts for an external encoder if required. The power supplied for the encoder can be turned **OFF** when the transponder **SELECTMODE** knob is in the **ON** position (mode **A**). Power is only supplied when operating in the **ALT** position (mode **C**). This function is provided to save power when operating solely from a battery supply.

Rotate **CODE ADJUST** knob	Scroll to **ENCODER POWER** option
Press **ENTER** key	To select **ENCODER POWER** option
Rotate **CODE ADJUST** knob	Set **E/C POW = ALT/ALL** Select **ALT** for encoder power in **ALT** mode only
Press **ENTER** key	Message **SAVED** appears briefly on the display
	Display returns to **ENCODER POWER** in **PROGRAM MODE** menu

ALT Encoder power is on in **ALT** and **DISP ALT** modes only

ALL Encoder power is on in all modes.

DISPLAY TYPE

This function is reserved for control management of a remote display, or a second display.

DISPLAY BRIGHT (SF Model only)

The minimum and maximum display brightness levels can be pre-set to allow the desired levels of brightness for daytime and night time operation. Min Bright and Max Bright are expressed as percentages.

Rotate **CODE ADJUST** knob	Scroll to **DISPLAY BRIGHT** option
Press the **ENTER** key	To select **DISPLAY BRIGHT** option
Rotate **CODE ADJUST** knob	Set **MIN Bright XX%** (range = 0 - 99%) The default is factory setting
Press **ENTER** key	The message **SAVED** appears briefly on the display
Rotate **CODE ADJUST** knob	Set **MAX Bright XXX%** (range = 0 – 100%) The default is factory setting
Press **ENTER** key	The message **SAVED** appears briefly on the display
	Display returns to **DISPLAY BRIGHT** in **PROGRAM MODE** menu

IMPORTANT NOTE
You may have to experiment with these settings to achieve the desired brightness level for day and night use. You cannot set the maximum brightness percentage to a lesser value than the minimum percentage.

DISPLAY TIMEOUT (SF Model only)

The display brightness/backlighting can be turned off after a pre-set period of time to reduce battery consumption. This feature is predominately used in aircraft that may only have battery power, without a charging circuit. Other users that may find this feature of benefit are pilots who prefer a dark cockpit at night, thus helping to preserve night vision.

Rotate **CODE ADJUST** knob	Scroll to **DISPLAY TIME OUT** option
Press the **ENTER** key	To select **DISPLAY TIME OUT** option
Rotate **CODE ADJUST** knob	Select either **DSP Tout = ON/OFF** The default is **OFF**
Press the **ENTER** key	The message **SAVED** appears briefly on the display

If you select **DSP Tout = ON** the time value must now be entered. Time values are entered in whole minutes as a two digit number eg three minutes = **03**

Rotate **CODE ADJUST** knob	Set **DSP Tout = 03**
Press **ENTER** key	The message **SAVED** appears briefly on the display
	Display returns to **DISPLAY TIME OUT** in **PROGRAM MODE** menu

IMPORTANT NOTE
During operation with the display time out activated, touching any control will reactivate the display.

BAROMETRIC UNITS

The barometric units must be set to the officially recognised units for the country in which the transponder is being operated. This selection becomes the unit of measure for **QNH** (barometric pressure) settings. The two options are **MB** for millibars, and **HG** for inches mercury.

Rotate **CODE ADJUST** knob	Scroll to **BARO UNITS** option
Press the **ENTER** key	To select **BARO UNITS** option
Rotate **CODE ADJUST** knob	Set **BARO = MB/HG** The default is **MB**
Press **ENTER** key	The message **SAVED** appears briefly on the display
	Display returns to **BARO UNITS** in **PROGRAM MODE** menu

EXIT PROGRAM

This menu item allows the user to exit from the **PROGRAM MODE** menu.

Rotate **CODE ADJUST** knob	Scroll to **EXIT PROGRAM** option
Press the **ENTER** key	To select **EXIT PROGRAM** option
Rotate **CODE ADJUST** knob	Select either **EXIT = Y/N** The default is **Y**
Press **ENTER** key	The message **PROGRAM EXIT** appears briefly on the display
	Display returns to selected display mode

If **N** is selected the display will return to **PROGRAM MODE**, which is displayed briefly before advancing to the first menu item.

FREQUENTLY ASKED QUESTIONS:

Normal Transponder operations.

The following questions are common to most users and may help you understand the operation of the T2000, some of these are explained in the user manual but may have been missed by the reader:

Q. When I am asked to sqwawk Ident (ID) the R indicator stays on for a long time.
A The R or reply , is used both for indicating a reply to an interrogation , and for indicating an ident reply , the reply will stay on for 20 seconds before returning to normal operation.

Q When asked to go to mode C from mode A , the altitude does not appear on the ground station for some time, usually after 8 minutes , is this normal?
A Yes , if the encoder has the option for mode C only power on (see setup) , then when in mode A it will have no power applied to it, in mode C the power is applied for the first time. Some encoders have a warmup period of 5 to 8 minutes, so the encoder information will be missing for this period. One way to overcome this is to have the encoder power on selected to ALL (in the options , setup) . This means that as soon as the unit is turned on , the encoder will be running. For power conservation (Gliders etc) we recommend power on mode C only.

Q I have mode C selected and when I taxi around an S appears instead of C , even though it is not in standby!
A. The unit has been wired with the external standby to an airswitch. This is a safeguard against operations on the ground. When the plane reaches a certain speed the S will toggle back to a C (same happens in modes A and ALT). Again when landing an the speed reduces , it will toggle back to S (standby). Another possible cause may be that instead of being wired to an airswitch , it may be wired to a stick mounted toggle switch – make sure it is switched off if you require normal operation! Please note , the T2000 standby switch will still work on the ground or in the air – you can always select standby!

Q I have noticed that sometimes when I switch off from the Avionics masters switch , and turn on this way the T2000 turns on , but if I turn off the T2000 from it's own on /off , when I turn on the avionics master the next time , the T2000 is off! It has to be turned on again from the T2000 on / off button , is this normal?
A Yes , this is perfectly normal. The T2000 remembers the last condition it was in, if you turn it off from the master whilst it is running , it will turn on again the same way. If you use the on / off button on the T2000 , it will remember the last state it was in . In normal operation we advise the use of the on/off on the T2000, as this will give the unit protection against voltage surges, however, in some installations the use of an avionics master tends to make this process obsolete for some – we still recommend turning it off and on via the T2000 on/off button!
Q Whilst flying outside normal radar coverage I have noticed that the reply symbol still flashes from time to time – what causes this?
A Other aircraft fitted with TCAS systems can still interrogate none TCAS equipped aircraft like yours. This then lets them know where you are, and is displayed on their TCAS screens. The aircraft could be 100 or miles away and at altitudes +30 or 40,000ft!

This concludes our FAQ's , you can log on to www.microair.com.au for others FAQ and technical data.

Limited Warranty

Microair Avionics Pty Ltd warrants this product to be free from defects in materials and workmanship for 1 year from the date of purchase. Microair Avionics will, at its sole discretion, repair or replace any components, which fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labour. The customer shall be responsible for any transportation costs for return of this product to Microair Pty Ltd.

This warranty does not cover failures due to abuse, misuse, accident, incorrect installation, unauthorized alteration, or repairs. It shall be at Microair Pty Ltd's sole discretion to decide if a defect is a result of material or workmanship failure.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING ANY LIABILITY ARISING UNDER WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUARY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE, AND COUNTRY TO COUNTRY.

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To obtain warranty service, CALL the Microair Avionics Support line in Australia:

Phone: ++ 61 7 41 553048
Fax: ++ 61 7 41 553049
Email: support@microair.com.au

Call to obtain a return authorization tracking number when returning any product to Microair. The unit should be securely packaged with the tracking number clearly marked on the outside of the package, and sent freight pre paid and insured to:

Microair Avionics PTY Ltd
P O Box 5532
Bundaberg West
Queensland 4670
Australia

Microair may at it discretion, refer product returns for repair or service, to a service facility closest to you. A copy of the **original sales receipt** is required as proof of purchase for warranty repairs. Microair Avionics PTY Ltd reserves the right to repair or replace the unit or software or offer a full refund of the purchase price at it's sole discretion.

SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.